

A SUBMILLIMETER/MILLIMETER SPECTROMETER
FOR HIGH REDSHIFT GALAXY SURVEYS
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ABSTRACT

We propose to develop a moderate resolution millimeter-wave spectrometer cover a wide spectral range from 800 μm to 2.3 mm. The spectrometer (BASS) will be the first instrument of its kind with the sensitivity and spectral bandwidth optimized for systematic follow-up observations of the far-infrared galaxies to be detected in the next generation of survey instruments, including the mm-wave camera BOLOCAM and SIRTf/MIPS. The spectrometer will use 4x85 bolometer array similar to those being developed for the ESA/NASA Planck Surveyor and FIRST space missions, but with significantly higher sensitivity. BASS will have bandwidth two orders of magnitude larger than existing heterodyne instruments, and sensitivity 10 times greater than Fourier-transform spectrometers coupled to direct detectors. The spectrometer will greatly reduce the time required to obtain a complete millimeter-wave spectrum of distant infrared-bright galaxies, making determination of millimeter-wave redshifts a practicality for the first time.